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Air Force Materiel Command
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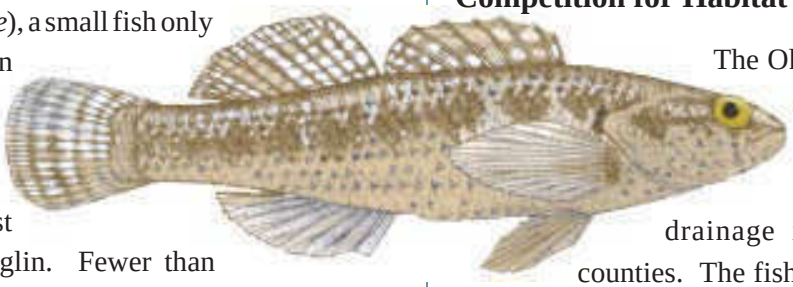
The Okaloosa Darter

Introduction

Eglin Air Force Base is the largest air force base in the free world, including 724 square miles of land area and about 130,000 square miles of controlled airspace overlying land and water. In this setting, Eglin conducts its primary mission of full-service air armament development through weapons system research, development, testing and evaluation; training; space operations; and base and range support. While fulfilling its mission, Eglin also manages its natural resources, acting as a steward to protect plants and animals for future generations.

The streams at Eglin are home to the Okaloosa darter (*Etheostoma okaloosae*), a small fish only about 1 to 2 inches in length. The Okaloosa darter lives in a limited range of less than 250 miles of streams, almost all of which are at Eglin. Fewer than 10,000 Okaloosa darters are thought to exist, although the exact number is not known. Several stream sections that had darters just decades earlier no longer support this fish. A primary reason is alteration or loss of suitable habitat.



Because of its small range, limited numbers and population pressures, the Okaloosa darter is listed as endangered by the U.S. Fish and Wildlife Service. Eglin natural resource managers are cooperating with federal and state agencies to manage the recovery of the fish on base.

While little is known about the darter's development, biologists do know that the fish does not reproduce quickly. On average, only about 26 of its eggs are mature for spawning, and each of those is attached to submerged plants or woody debris, one or two at a time, following courtship.

Recently, the brown darter (*Etheostoma edwini*), an ecologically similar fish, was discovered in some stream sections that were formerly considered to have only Okaloosa darters. The brown darter has replaced the Okaloosa darter in some portions of the streams. Habitat loss or degradation has been associated with accumulations of silt in creekbeds, human and beaver interference with water flow, and, possibly, polluted runoff. The decline of the Okaloosa darter is significant as an indicator of habitat degradation.

Competition for Habitat

The Okaloosa darter is confined to six streams that flow into Boggy and Rocky Bayous of the Choctawhatchee Bay drainage in Okaloosa and Walton counties. The fish is found most often around plants, roots or woody debris along the margins of shallow, sandy streams 4- to 40-feet wide. These streams have predominantly clear, sand-filtered groundwater that is cooler in the summer and warmer in the winter than other surface waters. In contrast, the brown darter seems to thrive where runoff is a larger component of the streamflow. The brown darter also is capable of existing where little or no flow occurs, while the Okaloosa darter prefers flowing streams. Several stream sections have mixtures of the two darter species.

While the exact method or timing of brown darter colonization will probably never be known, brown darters are capable of replacing Okaloosa darters when stream

conditions change as they have in Swift Creek. So far, the brown darter has not established a home in the Boggy Bayou system.

Siltation

When land erodes and sediment runs off into streams, this process is known as *siltation.* Siltation is a serious problem for the Okaloosa darter and occurs at road crossings, sand and clay pits used to supply Eglin, and old railroad beds.

At some areas, several tons of sediment have been deposited into local streams. The Okaloosa darter is vulnerable to siltation and is rarely found where heavy siltation has occurred.

Siltation Reduction

Eglin is working with the U.S. Fish and Wildlife Service to help reduce siltation. Disturbed land sites are being planted with native vegetation to control erosion. The shapes of some of the sand and clay pits are also being changed to reduce the flow of soil into the creeks. On some of the more eroded pits, stairstep catch basins have been created to prevent sediment from moving downstream. Siltation at streams will be measured over the next several years to assess progress.

Studies also are underway to determine if silt is coming from other sources.

Okaloosa Darter Recovery Plan

Eglin has three main principles behind its Okaloosa darter recovery plan:

- determine biological characteristics and habitat requirements
- protect current populations and habitat
- increase population size and reestablish range

Improving the habitat by reducing siltation is one way to help meet these goals. Other efforts include limiting development of new roads and recreation areas that disturb habitat and reducing pollution from agricultural chemicals. Forest areas along some darter streams may be burned intentionally to increase the amount of sunlight reaching the stream bed. Additional sunlight will increase aquatic vegetation growth and improve habitat.

In addition to its work with the National Fish and Wildlife Service, Eglin is working with a variety of state and federal centers, including the Florida Game and Fresh Water Fish Commission and the Southeastern Biological Science Center of the National Biological Service. Research findings will help to identify the habitat requirements of the Okaloosa darter and ways to promote that habitat. Eglin has identified especially valuable habitat in its Okaloosa Darter Management Emphasis Area. Measures in this area will be designed to promote the long-term survival of the Okaloosa darter.

Okaloosa darter (actual size)